



US monetary policy, fund flows, and capital restrictions

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*The views expressed here are solely the responsibility of the discussant and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or its staff.

Overview

- Capital flows in the post-crisis period has garnered a lot of attention.
 - E.g., H el ene Rey’s 2013 Jackson Hole paper.
- Large literature studying portfolio flows, many motivated by unconventional monetary policies, or the “Taper Tantrum”.
 - E.g., Fratzscher, Lo Duca, Straub (2013), Ahmed and Zlate (2014).
 - Typically finds that US monetary policy tightening induce outflows.
 - Effects of capital controls are mixed across countries.
- Today’s presentation: evaluate the impact of unanticipated changes in US monetary policy on cross-country flows of mutual fund and Exchange Traded Fund (ETF).
 - How do capital controls in a given country alter investors’ reaction?

When there is a tightening shock to US monetary policy, capital restrictions is somewhat effective in stemming outflows from equity funds; not effective for bond funds.

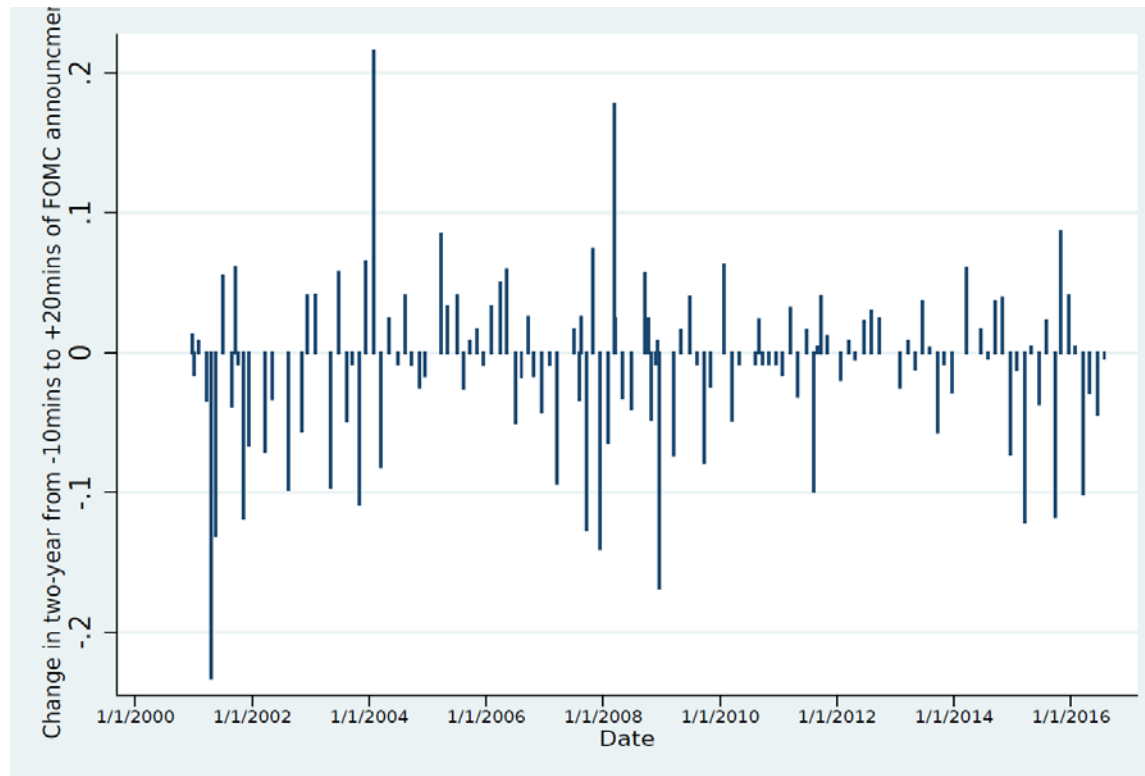
- What could drive these results and, given that large outflows are undesirable, what could be the appropriate policy response?

One possibility: daily liquidity offered by funds means that investors can redeem fund shares at will, even if underlying assets (e.g., EME bonds) are subjected to capital controls.



Measuring unanticipated changes in US monetary policy

- A proxy for unanticipated changes in US monetary policy: movements of the nominal two-year Treasury yields within a 30 minute window of an FOMC announcement (Hanson and Stein 2014).
- An additional proxy: the residuals of ten-year yield changes regressed on two-year yield changes.
 - Better capture the effects of Fed asset purchases, which targets primarily the 5-10 year segment of the yield curve.



Flows and allocations of mutual funds and ETFs

- Weekly equity and bond fund flows data (from EPFR) typically tracks the week (Thursday to Wednesday) immediately after an FOMC announcement (typically a Wednesday).
 - EPFR estimates, using fund-level flows and cross-country allocations, the changes in investments entering and leaving a country's equity and bond markets.

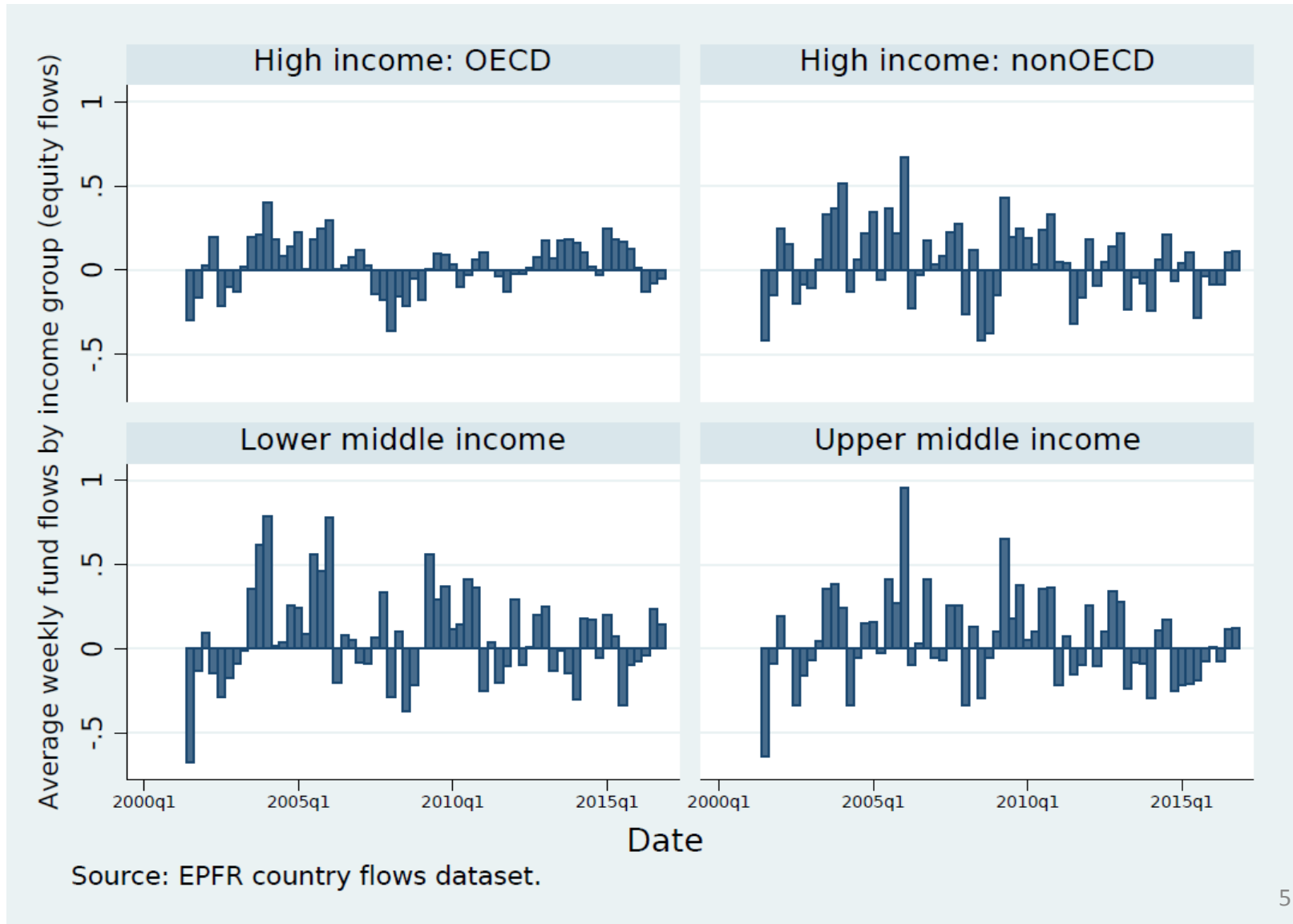
Looking at flows in the week immediately following monetary policy announcements allows us to gauge a fairly clean reaction of fund flows to monetary policy shock.

- Study a large panel of 80 or so countries.
 - More cross-sectional variation to study the effects of capital controls on the sensitivity of flows a monetary policy shock.
 - The dataset from Fernandez, Klein, Rebucci, Schindler and Uribe (2015) distinguishes controls on sales and purchases of local equity securities, separately from those on local bond securities.
 - Some countries in this dataset have changed controls over the past decade and a half → both time series and cross-sectional variation.

Matching fund flow sensitivities and capital controls at a country- and asset class-level allows us to evaluate more systematically the effectiveness of controls.

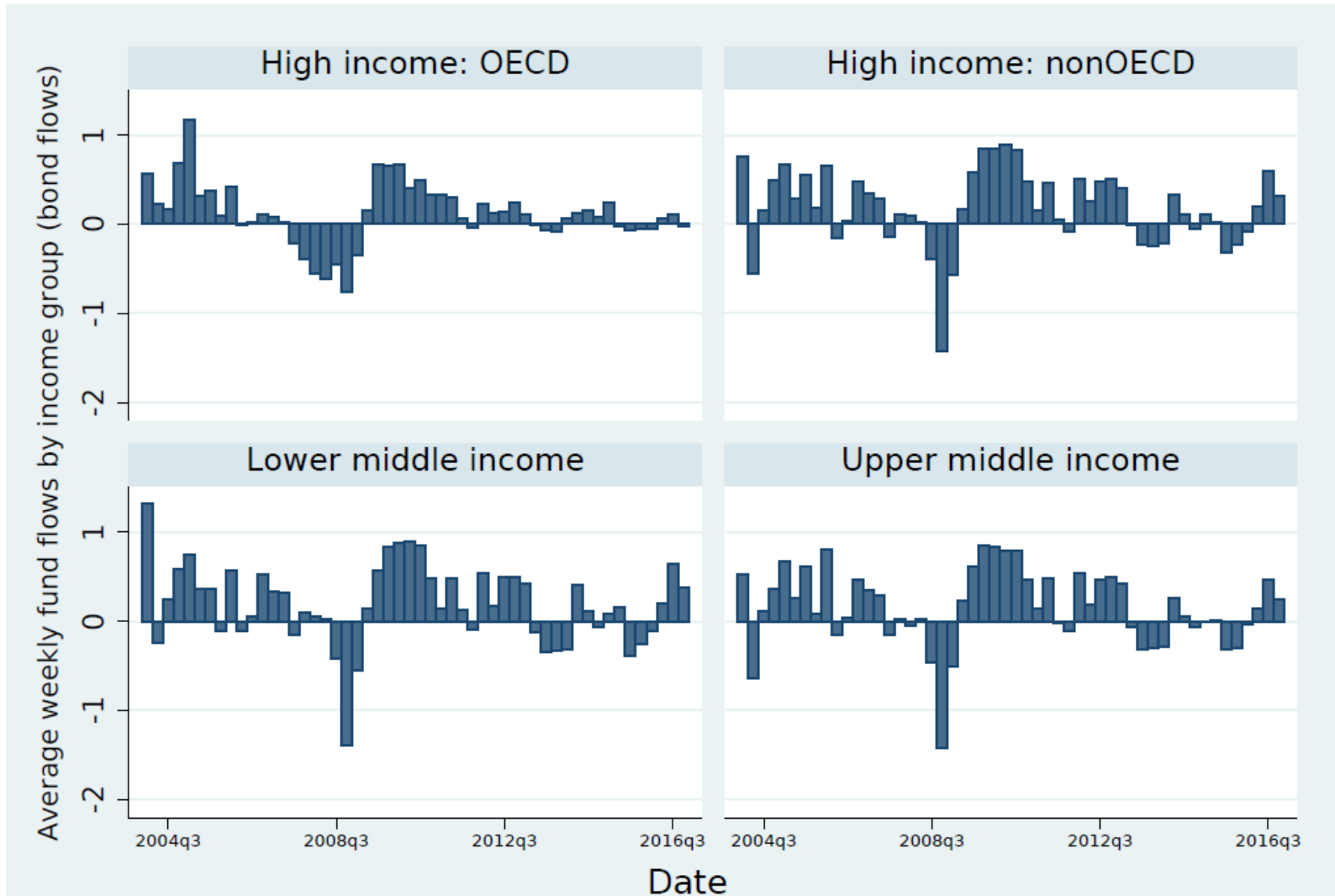


Average weekly equity flows by income group and quarter (in percent)





Average weekly bond flows by income group and quarter (in percent)



Source: EPFR country flows dataset.

Equity and bond capital flow restrictions

Variable	2005		2014	
	Number of countries without restrictions	Number of countries with restrictions	Number of countries without restrictions	Number of countries with restrictions
High income: OECD				
Equity inflow restrictions	25	1	24	2
Equity outflow restrictions	23	3	22	4
Bond inflow restrictions	24	1	25	2
Bond outflow restriction	22	3	21	6
High income: non-OECD				
Equity inflow restrictions	3	3	3	8
Equity outflow restrictions	4	2	5	6
Bond inflow restrictions	5	1	10	1
Bond outflow restriction	5	1	5	6
Lower middle income				
Equity inflow restrictions	5	5	7	6
Equity outflow restrictions	1	9	4	9
Bond inflow restrictions	11	5	10	7
Bond outflow restriction	6	10	8	9
Upper middle income				
Equity inflow restrictions	12	7	10	9
Equity outflow restrictions	8	11	7	12
Bond inflow restrictions	16	7	14	9
Bond outflow restriction	8	15	8	15

Source: Fernandez, Klein, Rebucci, Schindler and Uribe (2015).

Note: "Equity inflow restrictions" and "Equity outflow restrictions" correspond to the variables "eq_plbn" and "eq_siln", respectively, which capture sale or purchase locally by non-residents. The counterparts for bonds are "bo_plbn" and "bo_siln", respectively

Effects of capital flow restrictions on sensitivity of fund flows

$$\begin{aligned} flow\%_{i,t+1} = & \alpha_i + \Delta y_t * (\beta + \beta_{OFR} OR_{i,year(t)} + \beta_{IFR} IR_{i,year(t)}) \\ & + \Delta y_t * \mathbf{1}(\Delta y_t > 0) * (\gamma + \gamma_{OFR} OR_{i,year(t)} + \gamma_{IFR} IR_{i,year(t)}) \\ & + \sum_{s=0}^{p-1} \rho_s flow\%_{i,t-s} + \varepsilon_{i,t+1} \end{aligned}$$

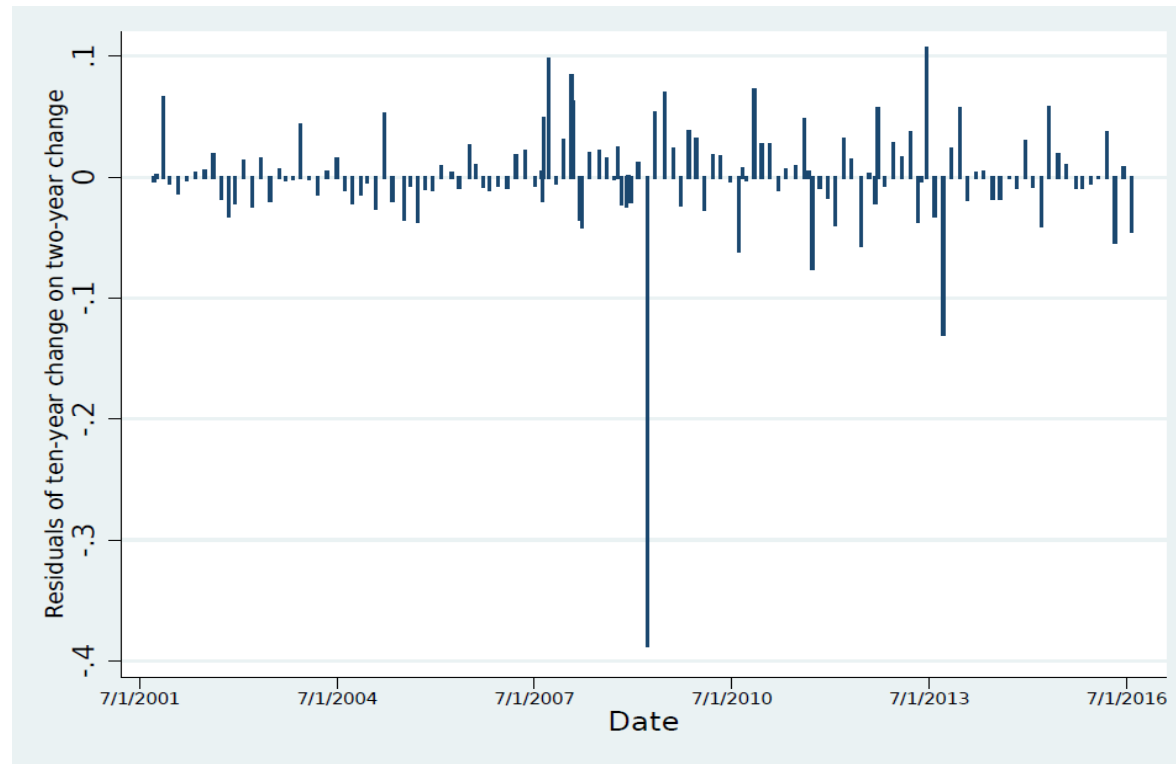
- i is a country; t is a week with an FOMC announcement (usually on Wednesdays).
- $flow\%_{i,t+1} = \frac{\text{net flows (in dollars) into country } i \text{ during } t+1}{\text{total net assets (in dollars) invested in country } i \text{ at week } t}$
- Δy_t is the change in a two-year yield with a -10 minutes and +20 minutes window surrounding the FOMC event of the week. A positive value indicates a **tightening** shock.
- $OR_{i,year(t)}$ (**O**utflow **R**estrictions) is a variable that takes on the value of 1 if there is a restriction on “sale or issue locally by non-residents” of equity or bond securities in the year week t is in, and 0 otherwise.
- $IR_{i,year(t)}$ (**I**nflow **R**estrictions) is a variable that takes on the value of 1 if there is a restriction on “purchase locally by non-residents” of equity or bond securities in the year week t is in, and 0 otherwise.

Regression results

	<i>flow%</i> _{<i>i,t+1</i>} for Equities		<i>flow%</i> _{<i>i,t+1</i>} for Bonds	
Δy_t (in percentage points)	-0.41	0.11	-0.95***	-0.78***
	0.36	0.35	0.15	0.19
$\Delta y_t * OR_{i,year(t)}$		-2.41***		-0.36
		0.79		0.22
$\Delta y_t * IR_{i,year(t)}$		1.95*		-0.08
		1.11		0.29
$\Delta y_t * \mathbf{1}(\Delta y_t > 0)$	-1.57***	-2.57***	-2.49***	-2.18***
	0.38	0.52	0.18	0.25
$\Delta y_t * \mathbf{1}(\Delta y_t > 0) * OR_{i,year(t)}$		2.17**		-0.54
		0.86		0.36
$\Delta y_t * \mathbf{1}(\Delta y_t > 0) * IR_{i,year(t)}$		-0.08		-0.26
		1.46		0.47
Lags of <i>flow%</i> _{<i>i,t+1</i>}	Four lags included			
Number of countries	76	76	84	83
Number of observations	8,569	8,567	7,753	7,732
Overall R^2	0.1946	0.1984	0.4393	0.4395

What about the post-crisis period with Federal Reserve asset purchases and forward guidance?

- Changes to the two-year yield may be inadequate in capturing the stance of unconventional monetary policy.
- Introduce $\Delta\tilde{y}_t$: the residuals of a regression of the change in the ten-year yield on the change in the two-year yield, in the 30-minute window surrounding an FOMC event (Gilchrist, Lopez-Salido and Zakrajsek 2015).
- A positive value indicates a tightening shock associated with unconventional policies, above and beyond what comes through the two-year. These are like **term premium** or **duration** shocks.





Regression results: post-crisis period (2008-now)

	$flow\%_{i,t+1}$ for Equities		$flow\%_{i,t+1}$ for Bonds	
$\Delta\tilde{y}_t$ (in percentage points)	-1.23***	-1.19***	-0.32***	-0.48***
	0.17	0.20	0.10	0.12
$\Delta\tilde{y}_t * OR_{i,year}(t)$		-0.39		0.16
		0.26		0.17
$\Delta\tilde{y}_t * IR_{i,year}(t)$		0.44		0.40
		0.32		0.27
$\Delta\tilde{y}_t * \mathbf{1}(\Delta\tilde{y}_t > 0)$	1.48***	1.84***	-1.59***	-0.75**
	0.41	0.55	0.25	0.37
$\Delta\tilde{y}_t * \mathbf{1}(\Delta\tilde{y}_t > 0) * OR_{i,year}(t)$		-0.20		-1.37***
		0.63		0.52
$\Delta\tilde{y}_t * \mathbf{1}(\Delta\tilde{y}_t > 0) * IR_{i,year}(t)$		-0.96		-1.10
		0.83		0.72
Lags of $flow\%_{i,t+1}$	Four lags included			
Similar regressions based on the two-year yield changes (Δy_t) included				
Number of countries	76	76	82	81
Number of observations	5,319	5,319	5,730	5,709
Overall R^2	0.2227	0.2263	0.5077	0.5092

Summary and interpretations

- Outflows from bond and equity funds ensue upon a tightening US policy shock. Inflows when the shock is instead an easing one.
 - Exception is that equity flows tend to respond positively to a duration shock.
- For equities, capital restrictions is somewhat effective in stemming outflows.
- For bonds, restrictions don't seem to do much.
 - During post-crisis period, outflows that result from duration shocks are *worse* for countries with outflow restrictions.

How to interpret these results?

- Our panel is very large, with many countries. Fixed effects alone not adequate in capturing cross-country heterogeneity—omitted variables bias.
 - The capital control indicators may simply be proxying other country-specific characteristics.
- The capital control variables only indicate whether restrictions are in place, and not much else.
 - The variables $OR_{i,year(t)}$ and $IR_{i,year(t)}$ do not contain information about what the controls are and how they're implemented.

Interpretations (continued)

- Capital controls could be effective, but the **liquidity transformation** nature of mutual funds introduces an incentive problem and a structural vulnerability.
 - Open-ended mutual funds (slightly under 20 percent of world financial assets) offer daily redemptions, often against illiquid underlying assets, including foreign bonds.
 - A fund must honor requests for redemptions of shares within a day, but it generally has limited liquidity resources to do so.
 - Generates a strategic complementarity problem—**first mover advantage**.

Rational investor should have a greater incentive to take their money out when they think others take their money out in the fact of illiquid conditions.

--Goldstein, Jian and Ng, 2016.
 - Investors will take money out without regard to capital restrictions, because they can → generates outflows from countries.
 - Testable hypothesis: illiquidity is a bigger problem when capital restrictions are in place to slow down the liquidation of assets → exacerbates the strategic complementarities (e.g., reaction of bond funds to duration shocks).
 - ETFs have similar dynamics, though arguably less problematic as ETF shares can be traded among investors.



Policy implications

- If the last interpretation is partially true, something more than capital controls is needed to prevent disruptive outflows.
 - The interaction between capital controls, investor behavior, and fund allocations is an active area of research.
- Policies targeted at the “flighty investors” may be helpful.
 - In the context of mutual funds, alleviate the strategic complementarity: liquidity requirements at open-ended funds, endogenizing the illiquidity of assets (including the presence of capital controls).
 - Financial Stability Board’s 2016 Consultative Document: prevent asset price spirals and firesale externalities.
 - SEC’s 2016 investment fund liquidity rules: protect investors and fund blow-ups.
 - IMF’s AREAER 2014 Annual Report: cross-border coordination between **source and recipient** countries.